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related with your jealousy, etc. Experience is full of correlations and it is the business of the various sciences to discover them and to record them. Once this is completely done, there is nothing else to do but sit down and take experiences as they come. But the correlation of what we call a mental fact with what we call a physical fact is no more mysterious than, and is the same in kind as, any correlation between two physical or between two mental facts.

Each experience will be found to require varied attendant experiences, or what we call conditions. Some of these conditions will be found common to all organisms, and the correlated experiences, with high statistical frequency, will form the "natural" order, and will be studied by the physical sciences. Other experiences will be found to depend on sets of conditions, attendant experiential complexes, which occur much less often, less easily, but may sometimes be found frequent in certain special groups or localities. These we will call affective, epidemic, social experiences. Sociology, medicine, esthetics, and ethics will study them. Many experiences will be found to depend on fine adjustments and close connections of attendant circumstances. These will occur still less commonly and will constitute the general subject-matter of psychology.

But there will be throughout no gulf between psychical and physical, between the natural and the mental orders. It is as meaningless to ask, "Does consciousness exist?" as it is to ask, "Does nothing exist but consciousness?" It is quite unnecessary to insist on giving up either one end of the experience continuum or the other end. It is equally unnecessary to talk about the two extremes as if they were fundamentally and qualitatively different sorts of being, displaying a mysterious and inexplicable dualism or parallelism or interaction or identity or what not. All experiences take their place in the surface of frequency and the differences between them are not a matter for mystical rumination, but for such attempts at correlation as those in which the empirical sciences are engaged.

H. L. HOLLINGWORTH.

COLUMBIA UNIVERSITY.

REVIEWS AND ABSTRACTS OF LITERATURE

The Psychological Researches of James McKeen Cattell. A Review by Some of his Pupils. New York: The Science Press. 1914. Pp. 101.

The purpose of this little volume is indicated in its foreword: "The pupils of Profesor James McKeen Cattell, wishing to recognize in some public way his completion of twenty-five years of service as professor of psychology, have decided to attempt a review, in brief compass, of his work in psychology, with some notice also of recent developments in several lines in which he has been a pioneer . . . it is hoped that this volume may bear witness, in a modest way, to the high esteem and sincere affection in which Professor Cattell is held by the many whom he has trained and guided in the study of psychology."

The work contains six reviews, each of a different phase of Professor Cattell's work, as follows:

Professor Cattell's Work on Reaction Time, by V. A. C. Henmon; Professor Cattell's Studies in Reading and Perception, by Walter F. Dearborn; Professor Cattell's Relation to the Association Method, by F. Lyman Wells; Professor Cattell's Psychophysical Contributions, by R. S. Woodworth; Professor Cattell's Studies by the Method of Relative Position, by H. L. Hollingworth; Professor Cattell's Relation to the Study of Individual Differences, by E. L. Thorndike.

Each reviewer points out fully the value possessed by Cattell's researches, by virtue both of the results reached by Cattell himself and of the further studies by which his work has been followed and, presumably, inspired. A good deal of attention is given also to historical setting. This is especially true of the review by Henmon, which traces the history of work in reaction time from the earliest times to the present, and constitutes one third of the volume.

Henmon concludes his review with the statement, which can not be questioned, that "the two most prominent contributors to the literature of reaction time have been Professors Wundt and Cattell." As regards the specific problems which Cattell investigated, Henmon gives the following enumeration: "His experiments furnished new and valuable data on the inertia of sense organs, rapidity of conduction to and from cerebral centers, the influence of the quality and intensity of stimuli, mode of reaction, the significance of the time interval between the signal and the stimulus, the effect of varying degrees of concentration in the fore period, the effects of practise and fatigue, and an analysis of the times of cognition, discrimination, choice, association, and judgment. This enumeration makes it evident that Cattell's research ranges over practically the whole of this field of experimental work and that no other investigation of the time-relations of mental phenomena is comparable with it."

In all this work, Cattell's major interest was not in the detailed introspective analysis of the processes involved, but rather in the psychophysical determination of the time taken up by the mental operations in which one is constantly engaged.

In the review by Dearborn of Cattell's researches on perception and reading, we meet with a description of Cattell's tachistoscopic experiments. These bore upon the number of objects which can be simultaneously considered. They showed that "on an average, consciousness can at one time grasp four numbers, three to four letters, two words, or a sentence composed of four words." Another problem, of which Cattell was a pioneer investigator, was that of the relative legibility of the letters of the alphabet and of printing types. Cattell also published measurements of the time required to read aloud letters and words, and to name colors and pictures, and, further, determined the time that light reflected from a word or letter must act upon the retina in order to be distinguished. This time was found to be slightly shorter for words than for letters, an observation which had important bearings for the pedagogy of reading.

Cattell's studies in association consist of two papers published in *Mind,* one in 1887 and the other in 1899. The first deals mainly with the time taken up by controlled and partially controlled associations. The second deals with the subject of free association. The most striking fact about this work, perhaps, is that it gives the frequency of the commonest responses for each of 20 words, as found in the responses of nearly 500 subjects, and the frequency for two words of all the responses obtained. Thus, in a rudimentary way, it anticipates the Kent-Rosanoff frequency table, the highest development the association experiment has yet attained.

In the field of psychophysics, Cattell's main contribution was a work with Fullerton, "On the Perception of Small Differences." His results led him to propose the substitution of a square root law in place of Weber's law. This proposal has never met with much favor, but Woodworth thinks the square root law may hold in certain cases. In the only original contribution contained in the volume under review, Woodworth proposes a very interesting theory according to which both Weber's law and the square root law may be regarded as limiting cases.

In the review of Cattell's studies by the method of relative position (order of merit method) Hollingworth describes fully the method as it was first applied by Cattell in 1902 in his study of "The Time of Perception as a Measure of Differences in Intensity." This is followed by extracts from Cattell's well-known recent works on American men of science, and a brief account of the more recent applications of the method of relative position.

Thorndike's discussion of Cattell's relation to the study of individual differences makes further interesting comments upon Cattell's work on American men of science. "Some of you," he writes, "have doubtless often regretted that Professor Cattell has devoted himself within recent years so exclusively to the topic of individual differences to the relative neglect of investigations concerning the time of mental operations, the psychophysic law, fatigue, memory and association, in which fields he has shown such mastery. I can not join in this regret. From the point of view of public welfare, a community's scientific experts are its most valuable property. . . . If it is worth while to find out what training a future plumber needs to make a competent plumber and voter it is ten-thousand fold worth while to find out what training and facilities the future leader in science needs to make him do his best as an investigator and expert adviser of governments."

The general features of Cattell's work are perhaps best emphasized by Woodworth, who refers to his "catholic temper towards all varieties of psychological interest and at the same time his personal predilection for the more positive sides of the subject, for the study of behavior or conduct, for the use of objective and especially quantitative methods." Along with his predilection for quantitative methods, has gone a keenly critical attitude towards quantitative results.

"All pupils of Professor Cattell will bear witness of his attention to this matter of the probable error. How often have we presented our experimental results in seminar and drawn conclusions which seemed to us to be indicated, only to have our attention called to the probable error of our averages, and to be sent back to our experiments to gather more data or more accurate data. The experience was often disheartening at the time, but the outcome has been a high standard of reliability in the work issuing from the laboratory. If there has been in recent years a general improvement in this respect throughout the field of psychological investigation, I can not doubt that it is traceable, in part, to the influence of Professor Cattell, exerted through his writings and through his pupils, some of whom have taken an active part in the progress of quantitative psychology."

HERBERT WOODROW.

UNIVERSITY OF MINNESOTA.

Philosophy: What Is It? F. B. JEVONS. Cambridge: University Press. New York: G. P. Putnam's Sons. 1914. Pp. ii + 167.

This book is the result of a demand on the part of a group of laymen for some insight into the meaning of philosophy. It comprises five lectures delivered before a branch of the Workers' Educational Association. The avoidance of technical terms, the general simplicity of expression, the frequent summaries and the smoothness of the transitions in the argument are all that could be desired in a work of this nature. Although it is maintained that the main purport of the lectures is to present the question with which philosophy is concerned, we find as we proceed that the implication of the question involves an answer which amounts to a point of view. But perhaps such a step is unavoidable unless one stops with the formulation of the question.

Philosophy, it is maintained, is the attempt to answer the question: What is the meaning of life, of experience as a whole? It is then asserted that this query involves the assumption that life has a meaning, is a whole. Now since we shall discover that the final conclusion concerning the answer to the query of philosophy has its grounds in the conviction thus advanced, it appears that this procedure involves a begging of the question. Would not the problem be more satisfactorily posed in the form: Has life, my life, your life, a meaning; is it a whole? Or in what sense, if any, is experience to be conceived as a whole?

But let us return to the argument. After a chapter on the relation of science and philosophy, the theories of materialism and idealism are examined with regard to their adequacy to supply a satisfactory answer to this question concerning the meaning of life. Both materialism and idealism are rejected, since they prove to be merely abstractions. They explain only certain aspects or elements of experience, not the whole, not life in the concrete. Further, materialism involves determinism; idealism leads to skepticism. Since we have experience of choosing between alternatives,